

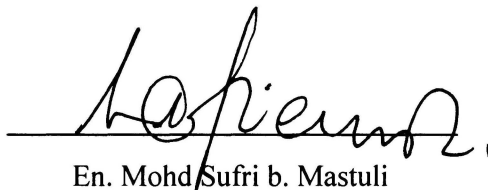
**SYNTHESIS AND CHARACTERIZATION OF LITHIUM –
SUBSTITUTED OF MAGNESIUM OXIDE**

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**Final Year Project Report Submitted in
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ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF LITHIUM – SUBSTITUTED OF MAGNESIUM OXIDE

Lithium substituted of magnesium oxide compounds were prepared via sol-gel method using magnesium acetate tetrahydrate and lithium acetate dehydrate as starting materials and oxalic acid as gelating agent. Five different composition of lithium substituted magnesium oxide; $\text{Li}_{0.2}\text{Mg}_{0.9}\text{O}$, $\text{Li}_{0.4}\text{Mg}_{0.8}\text{O}$, $\text{Li}_{0.6}\text{Mg}_{0.7}\text{O}$, $\text{Li}_{0.8}\text{Mg}_{0.6}\text{O}$ and $\text{Li}_{1.0}\text{Mg}_{0.5}\text{O}$ were prepared. The powder obtained was annealed at 950°C for 24 and 36 hours. The characterizations of these compounds were analyzed by using Thermal Gravimetric Analyzer, X-Ray Diffractometer and Scanning Electron Microscopy. The thermal study of magnesium oxide showed the temperature for stable formation of MgO was 500 °C and above. The results showed that, at 950 °C for 24 hours, only three different compositions of substituted compounds were accomplished, which were $\text{Li}_{0.2}\text{Mg}_{0.9}\text{O}$, $\text{Li}_{0.4}\text{Mg}_{0.8}\text{O}$ and $\text{Li}_{0.6}\text{Mg}_{0.7}\text{O}$. By increasing the annealing time into 36 hours for the same annealing temperature, pure products of $\text{Li}_{0.8}\text{Mg}_{0.6}\text{O}$ and $\text{Li}_{1.0}\text{Mg}_{0.5}\text{O}$ were obtained with other compositions except for $\text{Li}_{0.4}\text{Mg}_{0.8}\text{O}$. The morphology of MgO and their substituted MgO were changed from flower-like into rock-like by increasing the amount of lithium ion in the metal oxide matrix.